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United States Government **Department of Energy**

memorandum

DATE: December 20, 1999

REPLY TO ATTN OF: Office of Environmental Policy and Assistance:Koss 6-7964

SUBJECT: Information – Availability of EH-41 Guidance Document on EPA's Rule Establishing Air Emission Standards for Hazardous Waste Combustors

TO: Distribution

On September 30, 1999 (at 64 *FR* 52828), the Environmental Protection Agency (EPA) issued Part II of the final rule on hazardous waste combustor (HWC) emission standards. The emission standards and operating procedures for affected facilities are codified at 40 *CFR* 63 Subpart EEE. The emission standards were issued under the joint authority of the Clean Air Act and the Resource Conservation and Recovery Act. Part I of the rule was issued June 19, 1998, and is discussed in an Environmental Guidance Regulatory Bulletin issued by the Office of Environmental Policy and Assistance (EH-41) in August 1998 (available at: http://tis.eh.doe.gov/oepa/guidance/rcra/hwcombustors.pdf). Part II of the HWC rule sets Maximum Achievable Control Technology (MACT) emission standards for three categories of HWCs, including hazardous waste incinerators. The standards limit emissions of chlorinated dioxins and furans; mercury; particulate matter (as a surrogate for antimony, cobalt, manganese, nickel, and selenium); semivolatile metals (lead and cadmium); low volatile metals (arsenic, beryllium, and chromium); and hydrogen chloride and chlorine gas (combined). The rule also establishes standards for carbon monoxide, hydrocarbons, and destruction and removal efficiency as surrogates in lieu of individual standards for nondioxin/furan organic hazardous air pollutants.

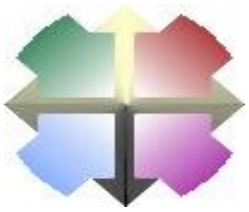
The HWC MACT rule will directly affect the operation of the Department of Energy's (DOE's) mixed waste incinerators at Savannah River, Oak Ridge and the Idaho National Engineering and Environmental Laboratory. Other existing and proposed DOE thermal treatment facilities and privately-owned facilities built to treat DOE waste may also be affected by the rule. Affected facilities will need to be in compliance with the standards by September 30, 2002 unless a one-year time extension is granted for the installation of pollution prevention or waste minimization measures. Affected facilities will also need to publicly issue a draft notice of whether or not the facility will comply with the MACT standards by June 30, 2000.

A guidance document discussing important provisions of Part II of the intricate HWC MACT rule that are relevant to the Department's operations is posted on the EH-41 web site: (pdf version: *http://tis.eh.doe.gov/oepa/guidance/caa/1569b.pdf* ; Word version: *http://tis.eh.doe.gov/oepa/guidance/caa/1569b.doc*). The text of Part II of the HWC MACT rule and additional background material are posted at EPA's HWC MACT home page: (*http://www.epa.gov/hwcmact/*).

Questions concerning the rule and the guidance should be directed to Ted Koss of my staff (*theodore.koss@eh.doe.gov*; 202-586-7964), or to Beverly Whitehead of the RCRA/CERCLA Division (*beverly.whitehead@eh.doe.gov*, 202-586-6073).

(original signed by Andrew Wallo III)

Andrew Wallo III
Director
Air, Water and Radiation Division



Guidance on EPA Standards for Controlling Emission of Hazardous Air Pollutants from Hazardous Waste Combustors

December 15, 1999

Prepared by the
Office of Environmental Policy and Assistance (EH-41)
Air Water and Radiation Division (EH-412)
RCRA/CERCLA Division (EH-413)

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Acronyms

ALARA	as low as reasonably achievable
APCD	air pollution control device
AWFCO	automatic waste feed cutoff
CAA	Clean Air Act
CEMS	continuous emissions monitors/monitoring system
CFR	Code of Federal Regulations
CMS	continuous monitoring system
DOC	Documentation of Compliance
DOE	U.S. Department of Energy
DRE	destruction and removal efficiency
dscm	dry standard cubic meter
EPA	U.S. Environmental Protection Agency
ESV	emergency safety vent
FR	Federal Register
HEPA	high efficiency particulate air filter
HWC	hazardous waste combustor
MACT	maximum achievable control technology
µg	microgram
ng	nanogram
NIC	Notice of Intent to Comply
NOC	Notice of Compliance
OEPA	DOE Office of Environmental Policy and Assistance
OPL	operating parameter limit
PM	particulate matter
POHC	principal organic hazardous constituent
ppmv	parts per million by volume
RCRA	Resource Conservation and Recovery Act
RD&D	research, development, and demonstration

SSRA	site-specific risk assessment
SSM	startup, shutdown, and malfunction
TEQ	toxicity equivalence [see definition at 40 CFR 63.1201(a)]

Summary

On September 30, 1999 (64 FR 52828), the Environmental Protection Agency (EPA) issued a final rule under the Clean Air Act (CAA) and the Resource Conservation and Recovery Act (RCRA) containing standards limiting emissions of certain pollutants from existing and new hazardous waste combustors (HWCs). The rule became effective on September 30, 1999. The emission standards are included in 40 CFR Part 63 Subpart EEE, “National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors." HWCs affected by the rule are hazardous waste incinerators, hazardous waste burning cement kilns, and hazardous waste burning lightweight aggregate kilns. The rule establishes emission standards for chlorinated dioxins and furans; mercury; particulate matter (as a surrogate for antimony, cobalt, manganese, nickel, and selenium); semivolatile metals (lead and cadmium); low volatile metals (arsenic, beryllium, and chromium); and hydrogen chloride and chlorine gas (combined). The rule also establishes standards for carbon monoxide, hydrocarbons, and destruction and removal efficiency as surrogates in lieu of individual standards for nondioxin/furan organic hazardous air pollutants.

The emission standards are expected to significantly impact the operation of DOE's three hazardous/mixed waste incinerators, other DOE thermal treatment units, and privately owned thermal treatment facilities constructed principally to treat DOE waste. DOE will need to prepare and publicly issue a draft Notice of Intent to Comply (NIC) by June 30, 2000 for each affected DOE facility stating whether the facility will comply with the emission standards or cease burning hazardous waste. For facilities that will comply, compliance must be achieved by September 30, 2002 unless a time extension (up to one year) is obtained to install pollution prevention or waste minimization measures (40 CFR 63.1213) or for installation of pollution control measures [40 CFR 63.6(i)].

Key dates for existing sources subject to Subpart EEE to come into compliance with the requirements are shown in Figure 1.

Task Name	2000				2001				2002				2003		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
FOR ALL FACILITIES SUBJECT TO MACT RULE:															
Submit notification of MACT rule applicability within 120 days of rule date (63.9(b))	◆														
Issue draft NIC for public review by June 30, 2000 and at least 30 days prior to			◆												
public meeting (63.1210(b) and (c), 63.1212)															
Public notice of NIC meeting no less than 30 days prior to public meeting (63.1210(b) and (c))			◆												
Public NIC meeting no later than 7/31/2000 and no sooner than 30 days after notice (63.1210(c))			◆												
Submit Part 70 (title V) permit application within 12 mos. of rule date (see 63.1200(a)(2), 70.5(a)(1)(i))				◆											
Submit final NIC no later than 10/02/00 (63.1210(a) and(b), 63.1212)				◆											
Submit compliance progress report on or before 10/01/2001 (63.1211(b), 63.1212)								◆							
ONLY FOR FACILITIES THAT WILL SHUT DOWN:															
See above requirements "FOR ALL FACILITIES SUBJECT TO MACT RULE" plus the following:															
Apply for 1 yr compliance date extension in NIC if applicable (63.1210(b)(1)(iv))			◆												
Identify submittal data for RCRA closure documents in NIC (63.1206(a)(2)(ii))			◆												
Submit RCRA closure notice at least 45 days before start of closure, or per 264/265.112(d)(1))							◆								
Cease burning hazardous waste no later than 10/01/2001 if no extension (63.1206(a)(2))								◆							
ONLY FOR FACILITIES THAT WILL COMPLY:															
See above requirements "FOR ALL FACILITIES SUBJECT TO MACT RULE" plus the following:															
No later than 10/1/2001:															
Apply for 1 yr 63.1213 or 63.6(i) extension of emissions standards compliance date as applicable								◆							
Complete engineering design for MACT modifications (63.1211(b)(1)(i))								◆							
Submit applicable construction applications to permitting agency (63.1211(b)(1)(ii))								◆							
(RCRA permit modifications may not be submitted before NIC is submitted, 270.42(j)(1))															
Contracts complete. If applicable, for needed modifications (63.1211(b)(1)(iii))								◆							
Submit performance test notice and plan at least I yr before test date (63.1207(e)(1)(i))									◆						
(See 63.1207(f), 63.7(c)(2)(i)-(iii) and (v), 63.1209(c)(3), and 63.1211(e) for required plan content)															
Submit CMS performance evaluation notice and plan at least 1 yr before eval. date (63.1207(e)(1)(i))									◆						
(See 63.8(e)(3)(i) for required plan content; see also 63.1209(d)(1))															
No later than 9/30/2002 (unless extension granted):															
Comply with CEMs end CMS requirements, emissions standards, initial OPLs											◆				
(63.1211(d)(3)(i), 63.1206(a)(1), 63.1211(d)(3)(ii)(B), 63.1206(c), 63.1209)															
Comply with operator training and certification requirements (63.1206(c)(6))											◆				
Comply with startup, shutdown, and malfunction plan requirements (63.1206(c)(2), 63.6(e)(3))											◆				
Comply with automatic waste feed cutoff requirements (63.1206(c)(3))											◆				
Comply with emergency safety vent requirements (63.1206(c)(4))											◆				
Insert startup, shutdown, and malfunction plan in operating record (63.1206(c)(2)(iv))											◆				
Insert emergency safety vent plan in operating record (63.1206(c)(4)(ii))											◆				
Insert DOC, including initial OPLs, in operating record (63.1211(d)(1))											◆				
Submit 60-day notification of performance test/evaluation (63.1207(e)(1)(i)(B))													◆		
Commence performance test no later than 6 mos. after 10/01/2002 (63.1207(c))														◆	
Complete performance test no later than 60 days after commencing test (63.1207((d)(3))															◆
Submit NOC, including final OPLs, within 90 days of completing test (63.1207(j)(1)(i), 63.1210(d))															■
Change from DOC to NOC requirements on NOC postmark date (63.1207(j)(1)(ii), 63.1210(d)(2))															■
(Removal of affected limits and conditions from RCRA permit must be coordinated in advance)															

Numeric references are for 40 CFR sections

Figure 1. Key Dates for Existing HWCs to Come into Compliance with Subpart EEE

Background

The emission standards issued by EPA implement §112(d) of the CAA. This section requires EPA to issue emission standards requiring the maximum degree of reduction in emissions of hazardous air pollutants that EPA determines is achievable taking into consideration costs, non-air quality health and environmental impacts, and energy requirements. The resulting emission standards are commonly referred to as Maximum Achievable Control Technology (MACT) standards.

Background information on the HWC MACT rule, including a questions and answers document and the full text of the rule, is available on the following EPA web site: http://www.epa.gov/hwcmact/.

In addition to meeting the MACT emission standards, HWC owner/operators must comply with applicable RCRA regulations at 40 CFR Parts 260 - 270 or comparable State regulations including those that are more stringent or broader in scope, when the State has adopted and/or is authorized to implement elements of its program in lieu of the Federal RCRA program.

Although the September 1999 rule contains most of the HWC MACT rule requirements, a final rule (i.e., Part I of the HWC MACT rule) covering four elements of the HWC MACT rule was issued June 19, 1998 (63 FR 33782). These elements covered:

1. an exclusion from the regulatory definition of hazardous waste for hazardous waste derived fuels that meet specification levels comparable to fossil fuels

2. revisions to RCRA permit modification procedures to address changes to a facility's design or operations that are necessary to comply with the MACT standards

3. requirements for the NIC and requirements for a progress report to be submitted by October 1, 2001

4. regulations providing for a compliance time extension for up to one year for the installation of pollution prevention or waste minimization measures.

The DOE Office of Environmental Policy and Assistance (OEPA) (EH-41) issued an Environmental Guidance Regulatory Bulletin in August 1998 covering the June 1998 rule. The Bulletin is on the EH-41 web site at http://www.eh.doe.gov/oepa/. The background discussion in the August 1998 Bulletin discusses the history of the rule, the affected DOE facilities, and the importance of the rule to DOE. Although the CFR sections in the June 1998 rule were redesignated in the September 1999 Federal Register notice (see 64 FR 52996-52997), the substantive provisions remain the same.

This document is intended to provide guidance to the DOE community for compliance with the September 30, 1999 HWC MACT rule. The document does not supersede the August 1998

Bulletin. DOE and DOE contractor personnel who manage facilities subject to the HWC MACT rule need to remain aware that CAA and RCRA regulations and regulations issued under the authority of State legislation affect the operation of HWCs in addition to the regulations in 40 CFR 63 Subpart EEE.

Affected DOE Facilities

The HWC MACT rule applies to hazardous waste incinerators (40 CFR 63.1200). The term "hazardous waste incinerator" is defined at 40 CFR 63.1201(a) to include any enclosed device that burns hazardous waste at any time and either: 1) uses controlled flame combustion and neither meets the criteria for classification as a boiler, sludge dryer, or carbon regeneration unit, nor is listed as an industrial furnace; or 2) meets the definition (at 40 CFR 260.10) of infrared incinerator or plasma arc incinerator. Incinerators meeting the preceding definition are subject to the HWC MACT rule regardless of the quantity of hazardous air pollutants emitted because the rule applies to both "area" and "major" sources as defined in §112(a) of the CAA [40 CFR 63.1200(a)(1)]. Both fixed and transportable incinerators are subject to the HWC MACT rule requirements.

The DOE facilities directly subject to the HWC MACT rule are the three incinerators that are authorized to treat hazardous waste and mixed low-level waste from the DOE complex and from the U.S. Navy. The three incinerators are:

- The Toxic Substances Control Act Incinerator at the East Tennessee Technology Park, Oak Ridge, Tennessee
- The Waste Experimental Reduction Facility at the Idaho National Engineering and Environmental Laboratory (INEEL), Idaho Falls, Idaho
- The Consolidated Incineration Facility at the Savannah River Site, Aiken, South Carolina.[(a)]

Other DOE facilities that thermally treat hazardous or mixed waste (e.g., the New Waste Calcining Facility at INEEL, miscellaneous DOE vitrification or melter units, or privately owned thermal treatment facilities built to treat waste generated in the DOE complex) that may not fit within the 40 CFR 63.1201(a) definition of a hazardous waste incinerator could still be subject to the HWC MACT emission standards via a State CAA or RCRA permit condition. Under §116 of the CAA, States can apply more stringent regulations to sources than the applicable EPA regulations and thus could apply the MACT standards more broadly than the HWC MACT rule requires. Under §6001(a) of RCRA, Federal agencies must comply with Federal, State,

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(a) Detailed information about the three incinerators and the types of waste they are permitted to treat can be obtained from the September 1998 document *Summary of DOE Incineration Capabilities*, DOE/ID-10651 Rev. 1, which can be accessed at http://www.doe.gov/bridge/home.html.

interstate, and local requirements regarding control and abatement of solid waste or hazardous waste disposal and management to the same extent as other entities. These requirements include the omnibus provision in §3005(c)(3) of RCRA [codified at 40 CFR 270.32(b)(2)] which provides that RCRA permits shall contain such terms and conditions as EPA or the State determines necessary to protect human health and the environment. As an example of the further extension of the HWC MACT standards, the standards could potentially be applied by a State or a regional EPA office to facilities regulated as miscellaneous units under the RCRA regulations at 40 CFR 264 Subpart X. The HWC MACT rule amends the environmental performance standards applicable to miscellaneous units to provide that the RCRA permit for such units is to include those requirements included in 40 CFR 63 Subpart EEE that are appropriate (40 CFR 264.601).

HWCs that Permanently or Temporarily Stop Burning Hazardous Waste

HWCs that permanently stop burning hazardous waste are not required to meet the HWC MACT emission standards provided 1) hazardous waste does not reside in the combustion chamber, 2) the HWC is in compliance with the RCRA closure requirements in 40 CFR 264/265 Subpart G, 3) the HWC complies with any other applicable emission requirements, and 4) the HWC operator notifies the permitting agency (i.e., the regional EPA office or the applicable State or regional agency when regulatory authority has been delegated by EPA to the State) that the HWC is no longer an affected source for purposes of the HWC MACT emission standards and operating requirements [40 CFR 63.1200(b)].

HWCs that temporarily stop burning hazardous waste are not required to meet the MACT emission standards and operating requirements provided 1) hazardous waste does not reside in the combustion chamber, 2) documentation of compliance with all other applicable CAA requirements is submitted to the permitting agency, 3) the Notice of Compliance (NOC; see the subsection on NOCs below) is revised to include the alternative mode(s) of operation (64 FR 52904), and 4) the operator documents in the operating record when the HWC is complying with the other applicable CAA requirements in lieu of the Subpart EEE MACT emission standards [40 CFR 63.1206(b)(1)(ii)]. If an operator intends to comply with other applicable CAA requirements for more than three months, the RCRA closure requirements in 40 CFR 264/265 Subpart G must be met unless a time extension is granted by the permitting agency (64 FR 52904).

RD&D Facilities and Facilities that Burn Exempted Hazardous Waste

Research, development, and demonstration (RD&D) sources are excluded from compliance with the HWC MACT rule provided they do not operate for longer than one year in a hazardous waste combustion mode after first burning hazardous waste [40 CFR 63.1200(b)]. The term

"research, development, and demonstration source" is defined at 40 CFR 63.1201(a). Hazardous waste facilities engaged in RD&D are subject to applicable RCRA requirements including 40 CFR 270.65.

HWCs that only burn exempted hazardous wastes are also excluded from compliance with the HWC MACT rule [40 CFR 63.1200(b)], but would still need to meet other applicable CAA requirements. Exempted hazardous wastes include used oil and gas recovered from landfills that are burned for energy recovery, fuels produced from the refining of oil-bearing hazardous waste, and materials that are not defined as solid wastes under RCRA and 40 CFR 261.4. Source, special nuclear, and byproduct material as defined in the Atomic Energy Act are among the materials that are, by themselves, not solid wastes subject to regulation as hazardous wastes under RCRA [40 CFR 261.4(a)(4)].

MACT Emission Standards for Incinerators

The maximum allowable emissions of regulated hazardous air pollutants under the HWC MACT rule for existing and new hazardous waste incinerators are set out at 40 CFR 63.1203(a) and (b) and are summarized in Table 1. New sources are sources constructed or reconstructed[(a)] after April 19, 1996 [40 CFR 1201(a)].

In addition to the emission standards shown in Table 1, the HWC MACT rule contains a destruction and removal efficiency (DRE) standard at 40 CFR 63.1203(c). The DRE requirement is a current performance standard for hazardous waste incinerators under RCRA regulations (40 CFR 264.343). EPA included it in the HWC MACT rule to control the emissions of organic hazardous air pollutants other than dioxins and furans. The basic DRE requirement is that a hazardous waste incinerator must achieve a DRE of 99.99% for each principal organic hazardous constituent (POHC). In addition, if a facility burns dioxin listed hazardous wastes FO20, FO21, FO22, FO23, FO26, or FO27 (defined at 40 CFR 261.31), it must achieve a DRE of 99.9999% for each POHC. POHCs are determined based on whether they are in the waste being burned and included in the list of hazardous air pollutants designated in §112(b)(1) of the CAA.

(a) A reconstructed source is a facility in which 1) components are replaced to such an extent that the fixed capital cost of the new components exceeds 50% of the capital cost of constructing a comparable new facility, and 2) it is technologically and economically feasible for the reconstructed source to meet the relevant standards (40 CFR 63.2). Interim status facilities under RCRA can make modifications to meet the HWC MACT standards even if the capital investment for the modifications exceeds 50% of the capital cost of a comparable entirely new hazardous waste management facility [40 CFR 270.272(b)(8)].

Table 1. MACT Emission Standards for Hazardous Waste Incinerators

Pollutant	Existing Incinerator	New/Reconstructed Incinerator
Dioxins and Furans	a. 0.20 ng TEQ/dscm, or b. 0.40 ng TEQ/dscm provided that the combustion gas temperature at the inlet to the initial PM control device is 400ºF or lower	0.20 ng TEQ/dscm
Mercury	130 µg/dscm	45 µg/dscm
Lead and Cadmium	240 µg/dscm, combined emissions	24 µg/dscm, combined emissions
Arsenic, Beryllium, Chromium	97 µg/dscm, combined emissions	97 µg/dscm, combined emissions
Carbon Monoxide and Hydrocarbons	a. carbon monoxide in excess of 100 ppmv over an hourly rolling average, dry basis, and hydrocarbons in excess of 10 ppmv over an hourly rolling average, dry basis, and reported as propane, at any time during the DRE test runs or their equivalent, or b. Hydrocarbons in excess of 10 ppmv, over an hourly rolling average, dry basis and reported as propane	a. carbon monoxide in excess of 100 ppmv over an hourly rolling average, dry basis, and hydrocarbons in excess of 10 ppmv over an hourly rolling average, dry basis, and reported as propane, at any time during the DRE test runs or their equivalent, or b. Hydrocarbons in excess of 10 ppmv, over an hourly rolling average, dry basis, and reported as propane
Hydrochloric Acid and Chlorine Gas	77 ppmv, combined emissions, expressed as hydrochloric acid equivalents, dry basis	21 ppmv, combined emissions, expressed as hydrochloric acid equivalents, dry basis
Particulate Matter (PM)	34 mg/dscm	34 mg/dscm
All emission levels are corrected to 7% oxygen TEQ = toxicity equivalence, the international method of relating the toxicity of various dioxin/furan congeners to the toxicity of 2,3,7,8-tetrachlorodibenzo-p-dioxin [40 CFR 63.1201(a)] Rolling average = the average of all one-minute averages over the averaging period [40 CFR 63.1201(a)]		

Compliance Options

New or reconstructed HWCs subject to the MACT emission standards sources must generally comply with the Subpart EEE standards by the later of September 30, 1999 or the date the source starts operations [40 CFR 63.1206(a)(3)].

There are three compliance options for an existing HWC subject to the MACT emission standards:

1. meet the MACT standards by September 30, 2002 or obtain a time extension pursuant to 40 CFR 63.6(i) or 63.1213 [40 CFR 63.1206(a)(1)]

2. not meet the MACT standards and cease burning hazardous waste no later than October 1, 2001 [40 CFR 63.1206(a)(2)(i)]

3. not meet the MACT standards but continue to burn hazardous waste until September 30, 2002 by meeting specified conditions for combusting the hazardous waste from another on-site source while that source upgrades to meet the HWC MACT standards or installs source reduction modifications to eliminate the need for further combustion of wastes [40 CFR 63.1210(b)(1)(iv)].

One of the preceding three options will need to be selected and discussed in the draft NIC. If Option 2 is selected, key dates for steps to be taken to stop burning hazardous waste including the date for submittal of the RCRA closure documents required under 40 CFR 264/265 Subpart G must be indicated in the NIC [40 CFR 63.1206(a)(2)(ii)]. The requirements for the NIC are discussed at pages 6-8 of OEPA's August 1998 Bulletin.

Requirements for the compliance extension of up to one year that is possible for the installation of pollution prevention or waste minimization measures (40 CFR 63.1213) are discussed at page 9 of the Bulletin. The September 1999 HWC MACT rule does not change the NIC or compliance extension requirements, but does recodify them (see 64 FR 52996-52997). A compliance extension is also related to the installation of pollution control measures [40 CFR 63.6(i)].

Permitting Requirements and Issues

All HWCs subject to the MACT standards will need to have their emissions included in an air operating permit (i.e., a Title V permit under the CAA) issued in accordance with §502 of the CAA [40 CFR 63.1200(a)(2)]. For affected sources not already subject to Title V, an application for a permit will need to be submitted to the applicable permitting agency by September 30, 2000 [40 CFR 70.5(a)(1)(i)]. EPA intends that the applicable MACT emission limits will be

incorporated into the operating permit and not into a HWC's RCRA permit (64 FR 52975). The air operating permit will also incorporate the operating requirements specified in the NOC [40 CFR 63.1206(c)(1)(v)].

Emission limits and operating parameters applicable to an existing HWC that were included in a RCRA permit will continue to apply to the HWC until the conditions are removed from the permit or the permit is terminated or revoked, unless the permit provides otherwise [40 CFR 264.340(b); 64 FR 53074]. To have the emission limits/operating parameter limits (OPLs) removed from a RCRA permit or to no longer be subject to the comparable RCRA interim status incinerator requirements, the owner/operator will first need to conduct a comprehensive performance test and submit the NOC [40 CFR 264.340(b) and 265.340(b)]. The HWC MACT rule added a provision to 40 CFR 270.42, Appendix I, to enable affected sources to submit a RCRA modification request to remove the relevant conditions from its RCRA permit. Part I of the HWC MACT rule also added a new 40 CFR 270.42(j) to streamline the process for modifying a RCRA permit. This provision is discussed at p. 5 of OEPA's August 1998 Regulatory Bulletin.

HWCs will continue to need a RCRA permit issued under 40 CFR Part 270 or comparable State provisions. In the preamble to the HWC MACT rule, EPA states that it intends that the air operating permit focus on the operation of the combustion unit (e.g., air emissions and related parameters) and the RCRA permit focus on the other basic elements of hazardous waste management such as general facility and unit-specific standards, preparedness and prevention, contingency planning and emergency procedures, manifesting, closure, corrective action, storage, materials handling, RCRA air emission standards for process vents, and leaks from tanks and containers (64 FR 52979). EPA only envisions coverage of emission limits and related OPLs in both a RCRA and an air operating permit when there is a need to impose more stringent or more extensive risk-based conditions in the RCRA permit, e.g., under the RCRA omnibus authority, to ensure protection of public health and the environment (64 FR 52979).

Permitting agencies commonly use site-specific risk assessments (SSRAs) as a quantitative basis for making determinations regarding the need for more stringent or extensive risk-based permit conditions. EPA anticipates that sources complying with the HWC MACT standards will not pose an unacceptable risk to human health or the environment (64 FR 52841). EPA recommends to permitting agencies that SSRAs "be conducted for facilities where there is some reason to believe that operation in accordance with the MACT standards alone may not be protective of human health and the environment" (64 FR 52841-52842). EPA issued a draft guidance document, *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities*, in 1998 covering methodologies for conducting SSRAs. The status of this document, including a link to the full text, is discussed at p. 18 of EPA's questions and answers document accompanying the HWC MACT rule at: http://www.epa.gov/hwcmact/qafin.pdf.

Notification Requirements

Notification requirements associated with the HWC MACT rule are summarized at 40 CFR 63.1210(a). Key requirements are summarized below.

Notification that the Source is Subject to the HWC MACT Standards

A source subject to the HWC MACT standards needs to notify the applicable permitting agency that the source is subject to the standards. The notification needs to be submitted by January 28, 2000 [40 CFR 63.9(b)].

Notification of Intent to Comply

The requirements for the NIC are discussed at pages 6-8 of OEPA's August 1998 Bulletin. EPA issued a technical correction rule on November 19, 1999 (64 FR 63209) to clarify that only those elements set out at 40 CFR 63.1210(b)(1)(ii) that apply to a particular source must be addressed in the NIC. The draft NIC for each affected facility must be made available for public review no later than 30 days prior to the public meeting on the draft. The public meeting must be held no later July 31, 2000. The final NIC must be submitted to the permitting agency no later than October 2, 2000 [40 CFR 63.1210(b)].

The NIC must be signed by a principal executive officer of DOE and must contain the following certification [40 CFR 63.1212(a)]:

> I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Notification of Compliance

An NOC must be submitted to the permitting agency within 90 days after completion of the initial comprehensive performance test and each subsequent comprehensive and confirmatory test [40 CFR 63.1210(d)]. The NOC must 1) document compliance or noncompliance with the MACT emission standards and continuous monitoring systems (CMSs), and 2) identify OPLs under 40 CFR 63.1209 [40 CFR 63.1207(j)(1)(i)]. Other required elements of a NOC are set out at 40 CFR 63.9(h). OPLs in a NOC must be complied with as of the postmark date [40 CFR 63.1210(d)(2)].

Recordkeeping and Reporting Requirements

A summary of the extensive documents, data, and information that must be kept in the operating record of a facility subject to the HWC MACT standards is in 40 CFR 63.1211(c). The "operating record" means the documentation retained at the facility and available for inspection by the permitting agency [40 CFR 63.1201(a)].

One important document that must be included in the operating record by the compliance date is the Documentation of Compliance (DOC) [40 CFR 63.1211(d)]. The DOC must identify the applicable emission standards and monitoring requirements. The DOC is also to include a signed and dated certification that: 1) required continuous emissions monitoring systems (CEMS) and CMSs are installed, calibrated, and continuously operating; and 2) the facility is in compliance with the Subpart EEE emission standards and monitoring requirements. Other important components of the operating record include the startup, shutdown, and malfunction (SSM) plan; the emergency safety vent (ESV) operating plan; the feedstream analysis plan; and the documentation associated with the operator training and certification program.

Reporting requirements associated with the HWC MACT rule are summarized at 40 CFR 63.1211(a). A key requirement is for the two-year compliance progress report. All sources subject to the HWC MACT standards need to submit a progress report no later than October 1, 2001. The report must be submitted to the appropriate permitting agency whether or not the source intends to comply with the MACT standards [40 CFR 63.1211(b)(4) and (5)]. The required content of the progress report is discussed at p. 8 of OEPA's August 1998 Regulatory Bulletin. EPA's November 19, 1999 technical correction rule (64 FR 63209) clarified that owner/operators can upgrade their pollution control equipment themselves and do not need to enter into a contract for another entity to perform the upgrade.

Performance Testing Requirements

The HWC MACT rule requires two types of performance testing to demonstrate compliance with the MACT emission standards: comprehensive and confirmatory performance testing [40 CFR 63.1207(b)]. General performance testing requirements applicable to all MACT sources are in 40 CFR 63.7.

Performance Test Plans

General performance testing includes a process similar to that used to develop a RCRA trial burn test plan and allows permitting agencies to review and approve MACT performance test plans [40 CFR 63.7(c)(2) and (3)]. The HWC MACT rule modifies this process by requiring that HWC owners/operators submit their site-specific comprehensive and confirmatory test plans and CMS performance evaluation plans to the permitting agency for approval at least one year

before the performance test and performance evaluation are scheduled to begin [40 CFR 63.1207(e)]. After its submittal, review and approval or notification of intent to deny approval will follow.

Performance test plans are to include a test program summary, the test schedule, data quality objectives, and both an internal and external quality assurance program [40 CFR 63.1207(f)]. In addition, the plan is to include other information including provision for an analysis of each feedstream, sampling and monitoring procedures, extrapolation methodologies used to calculate metal feedrate limits from performance test levels/rates, and procedures for stopping the hazardous waste feed in the event of an equipment malfunction [40 CFR 63.1207(f)(1)]. Information such as the characterization of operating parameters for which limits are to be established (e.g., using manufacturer specifications) and methods for monitoring and recording these operating parameters (e.g., maximum age of carbon in carbon beds) that may be unique to an HWC should also appear in the plan. HWC owners/operators that have not yet completed the RCRA trial burn and SSRA emissions testing but desire to coordinate SSRA testing (i.e., risk burn) with MACT performance testing are expected to address SSRA data collection requirements by submitting and implementing test plans that accomplish the objectives of both the risk burn and the performance test (64 FR 52916).

Performance test plans should demonstrate how a particular HWC will comply with the Subpart EEE requirements using available alternatives and options. For example, conducting sampling and analysis for metals in feedstreams at mixed waste incinerators may be problematic due to radioactivity of the waste and ALARA concerns. If the risk from metal emissions is minimal because HEPA filters are employed to prevent radioactive emissions, a procedure at 40 CFR 63.1209(g)(1) can be used to petition the permitting agency for an alternative monitoring method, e.g., use of a non-intrusive waste characterization method, including process knowledge (64 FR 52860). Similarly, owners/operators that believe they can use CEMS in lieu of compliance with OPLs can use the alternative monitoring provision at 40 CFR 63.8(f) [40 CFR 63.1209(a)(5)]. Additional site-specific HWC OPLs/conditions that might be addressed in performance test plans are shown in Table 2.

Table 2. Alternatives/Options for the Comprehensive Performance Test Plan

Provision	Citation
Waivers from monitoring levels of metals and chlorine in natural gas, process air, or vapor recovery systems	40 CFR 63.1209(c)(5)
Alternative monitoring or sampling and analysis frequencies (i.e., other than once per hour) for maximum solids content of the scrubber liquid	40 CFR 63.1209(m)(1)
Data compression techniques to record data from CMS, including CEMS, on a frequency less than that required by 40 CFR 63.1209	40 CFR 63.1211(e)

Changes in the comprehensive performance test plan's documented design, operation, or maintenance practices that occur after the compliance date but before NOC submittal require HWC owners/operators to revise their DOC to incorporate any revised limits necessary to comply with the standards. Furthermore, an updated test plan reflecting these changes must be maintained on-site [40 CFR 63.1206(b)(5) and 63.1211(c)].

Comprehensive Performance Testing

Comprehensive performance tests are conducted at the edge of the operating envelope (i.e., under worst-case conditions) with the results being used to: 1) demonstrate compliance with the CEMS-monitored emission standards for carbon monoxide and hydrocarbons; 2) conduct manual stack sampling to demonstrate compliance (initial and subsequent) with the MACT emission standards for pollutants that are not monitored using CEMS (e.g., dioxin/furan, PM, DRE, mercury, semivolatile metal, low volatile metal, hydrochloric acid/chlorine gas); 3) establish limits on the operating parameters required by 40 CFR 63.1209 (e.g., maximum flue gas flowrates and maximum hazardous waste feedrates), unless such limits are based on manufacturer specifications, to measure ongoing compliance with the emission standards for which CEMS are not used; and 4) demonstrate that performance of each continuous monitoring system is consistent with applicable requirements/specifications and the quality assurance plan [40 CFR 63.1207(b)(1)].

To ensure unit-specific operating limits are established such that they allow for operational flexibility, worst-case (high) metals feedrates may need to be used during performance testing. Alternatively, the HWC MACT rule allows owners/operators to request approval to establish metal feedrate limits based on extrapolating upward from levels fed during performance testing [40 CFR 63.1209(l)(1) and 63.1209(n)(2)(ii)].[(a)]

Initial Comprehensive Performance Test

Owners/operators must conduct their initial comprehensive performance test within six months of September 30, 2002 (the compliance date) and complete the test within 60 days of commencing the test [40 CFR 63.1207(c)(1) and 63.1207(d)(3), respectively]. Results must be submitted to the permitting agency within 90 days of completing the test. When owners/operators anticipate that they will operate under two or more modes, separate performance tests must be conducted under each mode and separate limits on operating parameters must be established for all modes. Owners/operators may elect to submit data from previous emissions tests in lieu of performing an initial performance test provided the data 1) was collected after March 30, 1998, 2) was part of a test demonstrating compliance with RCRA permit provisions, 3) was collected after achieving steady-state operations in conformance with normal operating conditions, and 4) is sufficient to establish applicable OPLs [40 CFR 63.1207(c)(2)].

(a) Extrapolating reduces the incentive to spike metals in feedstreams (and thus reduces the cost of testing, the hazard to test crews, and the environmental loading).

Subsequent Performance Testing

Subsequent performance testing must be conducted at frequencies discussed below (see "Frequency of Testing"). Emissions must remain in compliance with HWC MACT emissions standards at all times during each of these tests. To avoid a ratcheting-down effect, OPLs established during the initial performance test are automatically waived during subsequent comprehensive performance testing under an approved performance test plan [40 CFR 63.1207(h)]. This waiver applies only for the duration of the performance test and during pretesting, and can be conducted for an aggregate period up to 720 hours of operation. Within 90 days of completing each test, HWC owners/operators must submit and comply with an NOC that revises previously identified OPLs, as necessary, based on the levels achieved during each subsequent comprehensive performance test [40 CFR 63.1207(j)(1)].

Risk and Trial Burns

Although comprehensive performance tests are similar in purpose to and supersede RCRA trial burns (64 FR 52912), they involve relatively less oversight by the permitting agency and a higher degree of self-implementation. At facilities where unique site conditions and considerations make an SSRA necessary, the permitting agency can require a separate "risk burn" even after an HWC has completed its comprehensive performance test and submitted the NOC. Authority for collecting emissions data needed to perform an SSRA and accommodating the HWC MACT rule guiding factors used to determine if an SSRA is necessary (64 FR 52842) remains exclusively a RCRA matter (64 FR 52916).

For HWCs that have completed a RCRA trial burn and SSRA emissions testing prior to the date of the MACT comprehensive performance test, EPA does not anticipate repeating many risk assessments (64 FR 52842). Facilities that have not completed this testing can coordinate SSRA emissions data collection with MACT performance testing by factoring SSRA data collection requirements into the MACT performance test plan. Up to a one-year time extension may be obtained to coordinate performance of a RCRA risk burn with the MACT performance test. If, however, the timing of the SSRA data collection does not coincide with the MACT performance test requirement, testing under one program should not be unnecessarily delayed to coordinate with testing under the other. EPA expects permitting officials to decide whether to continue with the trial burn schedule laid out in the RCRA permitting process or coordinate with MACT performance testing based on a number of considerations (see 64 FR 52990). HWCs seeking permits that are subject to the MACT rule and that already have an approved, or close to being approved, trial burn plan are expected to continue with the trial burn as planned.

Confirmatory Performance Testing

The purpose of confirmatory performance tests is to verify HWC compliance with the dioxin/furan emission standard under day-to-day (i.e., normal) operations (which contrasts with comprehensive performance testing using worst-case wastes under worst-case conditions) [40 CFR 63.1207(b)(2)]. Thus, during these tests, operating conditions for certain specified

parameters are maintained in a range between the predetermined limits and the 12 month rolling average measured values, which are defined at 40 CFR 63.1207(g)(2) and do not include the use of inappropriate data such as calibration data, malfunction data, and data obtained when not burning hazardous waste (64 FR 52915).

HWC owners/operators must submit their notification of intent to conduct a confirmatory performance test, as well as a CMS performance evaluation and site-specific test plan, at least 60 calendar days before the test is scheduled to begin. The permitting agency has 30 calendar days after receipt of the original plans to provide the notification of approval or intent to deny approval of the test and CMS performance evaluation plans. Upon receiving approval, owners/operators must issue a public notice announcing that the plans have been approved and the location(s) where the plans can be reviewed [40 CFR 63.1207(e)(1)(ii)].

Consequences of Failing a Performance Test

HWCs that fail an initial or subsequent comprehensive performance test or any periodic confirmatory performance test must immediately stop burning hazardous waste until compliance with the HWC MACT standards can be demonstrated. Owners/operators must modify the design or operation of the unit, conduct any necessary pretesting and a new comprehensive performance test to demonstrate compliance with the emission standards (and other standards if the changes could adversely affect their compliance), and establish new OPLs, while not exceeding the 720 hours allotted to burn hazardous waste for such testing. If, however, an HWC conducted its performance test under two or more modes of operation, and the MACT emission standards are met when operating under one or more of the other modes, the HWC can continue burning under the modes of operation for which the standards were met (64 FR 52913).

Conditions for Waiver of Performance Testing

The HWC MACT rule contains a provision to obtain a waiver from conducting performance tests [40 CFR 63.1207(m)]. To take advantage of the waiver, the HWC owner/operator must be able to demonstrate that it feeds sufficiently low levels of mercury, semivolatile or low volatile metals, or chlorine using one of three implementation approaches. These approaches are: 1) establishing and continuously complying with one maximum total feedstream feedrate limit and one minimum stack gas flow rate for each waived pollutant; 2) establishing different modes of operation with corresponding minimum stack gas flow rate limits and maximum feedrates for metals or chlorine; and 3) continuously calculating uncontrolled stack gas emissions and recording these calculated values in the operating record on a continuous basis, assuming all metals or chlorine fed to the combustion unit are emitted out the stack (64 FR 52967). When it is impracticable to conduct sampling and analysis on the waste feedstream or an analysis determines the metals and chlorine cannot be detected in the feedstream, EPA assumes, for purposes of waiver, that the metals and/or chlorine are present at the full detection limit value. If compliance cannot be demonstrated when assuming full detection limits, the waiver should not be claimed. Also, the waiver provision waives performance testing and compliance with OPLs

for mercury, semivolatile metal, low volatile metal, or chlorine only. It cannot be used to waive the emission standards, monitoring, notification, recordkeeping, and reporting requirements (64 FR 52968).

Status of RCRA DRE Requirements

The HWC MACT rule includes a DRE requirement. HWCs that feed waste at a point other than the flame zone must demonstrate compliance and establish new OPLs at each comprehensive performance test. For all other affected sources, the DRE demonstration need be made only once during a source's operational life, either before or during the initial comprehensive performance test, provided that the HWC's design, operation, and maintenance features do not change in a manner that could reasonably be expected to adversely affect the ability to meet the DRE standard.

DRE Testing Procedure

The DRE demonstration involves feeding to the HWC a known mass of POHCs that are as or more difficult to destroy (i.e., lower thermal stability ranking) than any organic hazardous air pollutant, and then measuring for each POHC in stack emissions. If the POHC(s) is emitted at a level that exceeds 0.01% of the mass of the individual POHC(s) fed to the unit, the unit fails to demonstrate sufficient DRE (64 FR 52850).

Operating Parameter Limits for DRE

To ensure compliance with the DRE standard, HWC owners/operators must establish, monitor, and comply with the same OPLs as those established to ensure that good combustion practices are maintained for compliance with the dioxin/furan emission standard. Results from previous EPA or State-approved DRE demonstrations to fulfill the RCRA 99.99% DRE requirement may be used to document compliance with the DRE standard, as well as to set the necessary OPLs that ensure continued compliance provided 1) testing was performed after March 30, 1998, and 2) operations have not been changed in a way that could reasonably be expected to affect the HWC's ability to meet the standard [40 CFR 63.1206(b)(7)]. If a facility wishes to operate under new OPLs, a new DRE demonstration must be performed before or concurrent with the comprehensive performance test. If the DRE OPLs conflict with the OPLs that are set to ensure compliance with other MACT standards, the unit must comply with the most stringent limit (64 FR 52850).

Frequency of Testing

EPA requires periodic comprehensive performance testing because of its concerns that long-term stress to the critical components of a HWC (e.g., firing systems and emission control equipment) could adversely affect emissions. Due to the potential magnitude of impacts, EPA has adopted a comprehensive performance testing frequency of every five years (within

61 months after the date of commencing the previous comprehensive performance test) for small and large sources [40 CFR 63.1207(d)(1)]. More frequent comprehensive performance testing is required, however, if there is a change in design, operation, or maintenance that may adversely affect compliance [40 CFR 63.1206(b)(5)] or if the HWC fails a confirmatory performance test. HWC owners/operators that elect to submit data from previous emissions tests (e.g., a RCRA trial burn) in lieu of performing the initial comprehensive performance test must commence subsequent performance testing within 67 months of the compliance date [40 CFR 63.1207(d)(1)].

Confirmatory performance testing is required midway in the comprehensive performance testing cycle. Accordingly, HWC owners/operators must conduct confirmatory performance testing within 31 months after the date of commencing the previous comprehensive performance test. Owners/operators that submit data in lieu of performing the initial comprehensive performance test must commence confirmatory performance testing within 37 months of the compliance date [40 CFR 63.1207(d)(2)].

EPA recognizes that, although possible, testing in certain locations at certain times of the year (e.g., northern states in the winter) can be undesirable because it may add to the difficulty and expense of the testing. Accordingly, HWC owners/operators can request a time extension to allow for a more appropriate testing season (64 FR 52915). The rule also provides a performance testing window, which allows owners/operators to initiate subsequent tests any time up to 30 days after the five-year (60 month)/30 month deadlines. This testing window applies to both comprehensive performance tests and confirmatory performance tests (64 FR 52911, 52914).

Emission Monitoring Requirements

Initial compliance with the MACT standards is documented by stack performance testing. To document continued compliance with the carbon monoxide or hydrocarbon standards, HWC owner/operators must use CEMS. For the remaining MACT standards, owner/operators must document continued compliance with limits on specified operating parameters. These OPLs are calculated based on performance test conditions using specified procedures intended to ensure that the operating conditions (and by correlation the actual emissions) do not exceed performance test levels at any time. Owner/operators must also install an automatic waste feed cutoff (AWFCO) system that immediately stops the flow of hazardous waste feed to the combustor if a continuous emissions monitoring system records a value exceeding the standard or if an OPL is exceeded (considering the averaging period for the standard or OPL). The standards and OPLs apply when hazardous waste is being fed or remains in the combustion chamber irrespective of whether the corrective measures prescribed in the SSM plan are initiated.

Continuous Emission Monitoring Systems

The HWC MACT rule requires owners/operators to employ CEMS to demonstrate and monitor compliance with the carbon monoxide and hydrocarbon standards only, and use an oxygen CEMS to continuously correct the carbon monoxide and hydrocarbon levels to 7% oxygen [40 CFR 63.1209(a)]. These CEMS must be installed, calibrated, maintained, and operated continuously in compliance with the quality assurance procedures in Appendix A to 40 CFR 63, Subpart EEE, and Performance Specifications 4B (carbon monoxide and oxygen) and 8A (hydrocarbons) in Appendix B to 40 CFR Part 60. The quality control program for CEMS must be written, include detail step-by-step procedures and operations, kept on-site, and be available for inspection (40 CFR 63, Subpart EEE, Appendix A).

In response to questions and concerns regarding the availability and reliability of other CEMS, EPA states in the rule that it: 1) does not require the use of a total mercury CEMS; 2) defers the installation deadline and performance specifications for PM CEMS to subsequent rulemakings; and 3) is not issuing performance specifications for mercury, PM, multimetal, hydrochloric acid, or chlorine gas CEMS. Nevertheless, EPA is encouraging sources to evaluate the feasibility of using these CEMS. Under 40 CFR 63.1209(a)(5), EPA allows owners/operators to petition the permitting agency to use CEMS for PM, mercury, semivolatile metals, low volatile metals, and hydrochloric acid/chlorine gas emissions in lieu of compliance with the corresponding OPLs in 40 CFR 63.1209. The requirements for calibration and standardization of the optional CEMS may be as rigorous, however, as the performance test requirements. Although EPA did not finalize them, the proposed CEMS performance specifications for these pollutants may be useful as a point of departure when documenting specifications that are achievable and ensure reasonable correlation with reference manual methods (64 FR 52930).

Calibration Requirements

CEMS are first calibrated according to the manufacturer's instructions prior to the initial comprehensive performance test. The calibration must be checked on a routine basis. If the calibration has drifted outside of allowable limits, adjustments must be made. Individual performance specifications contain information and requirements on test procedures for calibration and zero drift, calibration error (where applicable), interference tests (where applicable), relative accuracy, and response time. HWC MACT rule calibration provisions generally require HWC owners/operators to present to the pollutant analyzer portion of the CEMS calibration gases of known concentrations to certify and assure monitor performance. Step-by-step procedures detailing the calibration of carbon monoxide, hydrocarbon, and oxygen CEMS which continuously corrects the carbon monoxide and hydrocarbons to 7% oxygen must be included in a HWC quality control program (40 CFR 63, Subpart EEE, Appendix A, Section 3). These procedures must be kept on record and be available for inspection.

HEPA System-Related Issues for PM CEMS Calibration

In contrast to calibration of other CEMS (which use calibration gas), optional PM CEMS that may be used will rely on a site-specific calibration process that defines the statistical relationship between CEMS response and PM loadings and involves correlating PM CEMS outputs to manual method results since the instrument response is dependent on PM characteristics (e.g., particle composition and size distribution). Calibration of the PM CEMS at low PM levels is expected to be extremely difficult to maintain. PM calibration over a full range of values may be especially problematic for DOE HWCs that burn highly variable waste streams and use HEPA filters to control PM emissions to very low levels[(a)] as part of their strategy to control radionuclide emissions.

Compliance Monitoring

Beginning September 30, 2002 (or September 30, 2003 if a one-year extension has been granted), HWC owners/operators must begin complying with the limits on OPLs as specified in the DOC. Unless an HWC is otherwise exempt, owners/operators must ensure that CMSs for each emission limit and each specified OPL are fully operational by the compliance date.

Initial compliance with MACT emission standards will be documented by manual stack testing. To document continued compliance with the carbon monoxide or hydrocarbon standards, owner/operators must use CEMS. Continued compliance for the remaining standards typically will be documented by monitoring and recording values for specified operating parameters for which limits are established during the initial comprehensive performance test using specified procedures that ensure operating conditions (and by correlation the actual emissions) do not exceed performance test levels at any time. Operating parameters for which each HWC must establish limits are categorized by EPA according to how they are monitored or established and are shown in Table 3. Table 3 reflects requirements in 40 CFR 63.1209.

Except for maximum combustion chamber pressure to control combustion system leaks (i.e., fugitive emissions), which is subject to instantaneous monitoring, permitting agencies will rely on measurement values based on parameter-specific averaging periods and rolling averages calculated in association with the most recent comprehensive performance test data to calculate an incinerator's compliance with the established MACT emission limits and OPLs. Required emission limits can potentially be below the MACT standards if the owner/operator demonstrates that the HWC operates in compliance at the lower limits during performance testing and the permitting agency determines that limits below the MACT standards are needed to protect human health and the environment.

(a) DOE facilities routinely use HEPA filters to control particulate radionuclide emissions. These HEPA filters achieve over 99.97% particulate removal efficiency for 0.3-micron diameter particulate.

Table 3. Monitoring Parameters and Requirements

Type of Monitoring	Operating/Regulated Parameter
I. Monitored directly with a continuous monitoring system	a. Combustion chamber pressure b. Combustion gas temperature in each combustion chamber and at the inlet to a dry PM control device c. Flue gas temperature at entrance to catalyst in catalytic oxidizer d. Temperature of carbon bed at inlet or exit e. Baghouse pressure drop f. For wet scrubbers: • pressure drop across the scrubber • liquid feed pressure (low energy scrubbers only) • pH • liquid-to-gas ratio or scrubber water flowrate and flue gas flow rate • blowdown rate • scrubber water tank volume or level • scrubber water solids content g. Power input to ionizing wet scrubber; power input to each field of an electrostatic precipitator h. Flue gas flowrate, production rate or surrogate gas residence time parameter i. Adsorber carrier fluid flowrate or nozzle pressure drop, for each injected adsorber j. Cumulative volume of combustion gas flow through each carbon adsorber bed segment since carbon emplacement
II. Monitored using (a) knowledge or analysis to determine concentration of the regulated parameter in each feedstream, and (b) continuous monitoring or other measurement of the flowrate of each feedstream	Feedrate limits for the following regulated parameters: a. Total semivolatile metals b. Total and pumpable low volatile metals c. Total mercury d. Total chloride and chlorine e. Total ash (for incinerators) f. Activated carbon, at each injection location (for carbon injection adsorber) g. Dioxin inhibitor h. Dry scrubber sorbent i. Total and pumpable waste feed
III. Other site-specific approved monitoring of parameters characterized on a site specific basis (e.g., using manufacturer specifications)	a. Activated carbon specifications b. Acid gas sorbent specifications c. Catalytic oxidizer catalyst specifications d. Dioxin/furan formation inhibitor specifications e. Maximum age of carbon in a carbon bed f. Individually determined operating parameter limits for PM control devices not specifically addressed in rule (e.g., HEPA filters) g. Maximum time in use for catalytic oxidizer catalyst and activated carbon in carbon beds

Averaging Times

OPLs (e.g., feedrate limits, temperature limits) generally integrate the use of averaging periods that are calculated on a rolling basis. In other words, each time a measurement sample is recorded, a new rolling average is calculated using the new sample and all previous samples obtained during the specified averaging period.

Averaging Periods for Operating Parameters

The HWC MACT final rule establishes three types of averaging periods. These are illustrated in Table 4 and do not include ten-minute averaging periods.

Table 4. Averaging Periods for Operating Parameters

Averaging Period	Operating Parameter
None (instantaneous)	Maximum combustion chamber pressure only
12-hour rolling averages	Maximum feedrate of mercury, semivolatile metals, low volatile metals, chlorine, and ash (for incinerators)
Hourly rolling average	All other operating parameters except combustion chamber pressure (instantaneous) and feedrate limits (12-hour rolling averages)

Two techniques must be used to average data from the comprehensive performance test when calculating limits on operating parameters. First, combustion gas flowrate and hazardous waste feedrate are based on the average of the maximum rolling averages for each run of the test. Second, hourly rolling average and 12-hour rolling average limits for all other parameters are based on the average level occurring during the comprehensive performance test. Examples of how the averages work are provided at 64 FR 52922. If a HWC owner/operator elects to define two or more different operating modes and conduct performance testing under each mode, the averages should be calculated for all runs under each test condition (representing each mode of operation).

OPLs will not become effective until monitoring data sufficient to calculate the rolling averages (i.e., 60 one-minute average values for the hourly rolling average limit and 12 hours of one-minute average values for the 12-hour rolling average limit) have been recorded. For periods of time when one-minute average values for a parameter are not recorded (e.g., during a three-week source shutdown for maintenance), the first minute of renewed operation is added to the last 59 one-minute averages before source shutdown occurred (64 FR 52924).

Averaging Periods for CEMS

The averaging periods for CEMS (other than carbon monoxide, hydrocarbon, and oxygen) were established to be equivalent to the time it takes to conduct three runs of the comprehensive performance test using manual stack methods. EPA concluded that a six-hour averaging period is most appropriate for PM CEMS, and a 12-hour averaging period is most appropriate for total mercury, multi-metals, hydrogen chloride, and chlorine gas CEMS (64 FR 52931). Relative to calculating their rolling averages, EPA recommends that PM, total mercury, and multimetal CEMS should be updated hourly. To accommodate CEMS variability and limitations concerning the correlation data collection, PM CEMS data is to be recorded as a block-hour with the rolling average being used every hour to update the previous six block-hours. If the CEMS (e.g., a light-scattering CEMS) does not produce a continuous stream of data throughout the hour, the PM CEMS needs to be observing stack gas at least half (30 minutes, or two 15-minute cycles of operation) of the block hour. This means that batch systems, such as beta gages, must complete one cycle of operation every 15 minutes, or more frequently if possible (64 FR 52932).

For hydrochloric acid and chlorine gas CEMS, the 12-hour rolling average (as with carbon monoxide and total hydrocarbon CEMS) should be updated every minute based on the average of the one-minute block average CEMS observations that occurred over the averaging period. Thus, to calculate the rolling average for hydrochloric acid and chlorine gas CEMS, each new one-minute average is added to the previous 719 one-minute average values to calculate a new 12-hour rolling average each minute. Initial compliance and intermittent operations are handled in the same manner discussed above for OPLs.

Alternative Monitoring Requirements

When existing site or unit conditions prevent, limit, or make it more cost-effective, safer, and/or convenient to conduct monitoring using alternative rather than conventional monitoring methods, HWC owners/operators can petition the permitting agency under 40 CFR 63.1209(g)(1) to use an alternative monitoring method (other than CEMS) to document compliance. Similarly, owners/operators can request approval under 40 CFR 63.1209(a)(5) to use CEMS to document compliance with emission standards in lieu of periodic performance testing and compliance with limits on operating parameters. In either case, owners/operators must recommend their selected alternatives in the comprehensive performance test plan that is submitted for review and approval. Examples (in addition to those discussed heretofore) include 1) use of robust air pollution control technologies, e.g., HEPA filters for PM; 2) use of conductivity and turbidity rather than measuring scrubber water concentration-based parameters manually every hour; 3) use of non-intrusive waste characterization methodologies such as non-destructive evaluation (e.g., radiographic inspection) or non-destructive assay [e.g., pulsed gamma neutron activation analysis box counter]; and 4) integration schemes that employ two or more alternatives.

Operational Requirements

HWC owners/operators must operate in accordance with their DOC or, once it is postmarked, the NOC, which must contain monitoring requirements under 40 CFR 63.1209 and operating requirements as set forth in 40 CFR 63.1206.

Startup, Shutdown, and Malfunctions

HWCs affected by the MACT rule are subject to 40 CFR 63.6(e)(3) with regard to SSM plan requirements [40 CFR 63.1206(c)(2)]. The SSM plan should demonstrate how the HWC will maintain compliance with the HWC MACT emission limits during startups, shutdowns and malfunctions, as well as return the HWC to compliance during upsets. If an operating requirement is exceeded during startup, shutdown, or malfunction when hazardous waste is not in the combustion chamber, owners/operators must follow the SSM plan to return to compliance as quickly as possible, unless the HWC will comply with the requirements of alternative CAA section 112 or 129 requirements that apply when hazardous waste is not burned. If, however, an operating requirement is exceeded during SSM and hazardous waste is in the combustion chamber, the exceedance is not excused by following the SSM plan, irrespective of whether corrective measures prescribed in the SSM plan are instituted.

Failure to comply with the SSM plan's operating requirements during the applicable periods is a violation and may subject the HWC owner/operator to an enforcement action. An updated SSM plan that reflects any “change” in reported design, operation, or maintenance practices as previously documented to the permitting agency must be maintained on-site in the operating record [40 CFR 63.1211(c)].

Feedrate Sampling and Control

Prior to feeding material, HWC owners/operators must obtain an analysis of each feedstream that is sufficient to document compliance with the applicable feedrate limits [40 CFR 63.1209(c)]. In the preamble to the HWC rule, EPA acknowledges that feedstream testing for metals is problematic for mixed waste incinerators due to the radioactivity of the waste and because risk from metal emissions is minimal in mixed waste incinerators that use HEPA filters to prevent radioactive emissions (64 FR 52860). Under these circumstances, EPA invites owner/operators of mixed waste incinerators to petition the permitting agency under 40 CFR 63.1209(g)(1) for use of an alternative monitoring method.

Feedrate limits for individual parameters (e.g., chlorine, ash, and mercury) are established during a successful comprehensive performance test by multiplying the concentration of the limited parameter (e.g., mercury) by the feedstream rate. This rate is determined using continuous monitoring of the volumetric or mass flowrate (61 FR 17443; April 19, 1996). Exceedance of a maximum hazardous waste feedrate will trigger the AWFCO because this

operating condition is fundamental to proper combustion of hazardous waste and an exceedance could quickly result in an exceedance of an emission standard.

Compliance with feedrate limits must be demonstrated on an on-going basis through periodic characterization of the feedstreams. Characterization involves an analysis of representative samples of the feedstreams obtained at frequencies based on site-specific characteristics of the waste using any reliable analytical method [40 CFR 63.1208(b)(8)]. Specific characterization requirements are set forth in a site-specific feedstream analysis plan (similar to the current RCRA required "waste analysis plan"), which must be recorded in the operating record and may be requested by the permitting agency [40 CFR 63.1209(c)].

Owners/operators of mixed waste incinerators can consider using available regulatory alternatives and options such as "process knowledge," use of a non-intrusive waste characterization methods [40 CFR 63.1209(g)(1)], or using CEMS in lieu of compliance with feedrate limits and/or the associated sampling and analysis [40 CFR 63.1209(a)(5)]. Although EPA agrees that "process knowledge" should be used to the fullest extent possible, especially in cases where it is dangerous to use direct sampling and analysis, characterization based on process knowledge should usually be confirmed through some degree of direct sampling and analysis.

Automatic Waste Feed Cutoffs

On the compliance date, AWFCOs must be fully functional and able to respond when a CEMS records a value exceeding the standard or an operating parameter limit is exceeded (considering the averaging period for the standard or operating parameter). The AWFCO must be interlocked with the parameter of concern, and it must immediately and automatically stop the flow of hazardous waste feed to the combustion device when any of the following occur:

1. Any of the following are exceeded: OPLs specified in 40 CFR 63.1209, an emission standard monitored by a CEMS, and the allowable combustion chamber pressure

2. The span value of any CMS, except a CEMS, is met or exceeded

3. A CMS monitoring an operating parameter limit under 40 CFR 63.1209 or emission level malfunctions

4. Any component of the AWFCO fails [40 CFR 63.1206(c)(3)].

After an AWFCO, combustion gases must continue to route through the air pollution control system and minimum combustion chamber temperature must be maintained as long as hazardous waste remains in the combustion chamber. Since immediate, instantaneous, and abrupt cutoff of the entire waste feed can cause perturbations in the combustion system that could result in exceedances of additional operating limits EPA allows a one-minute ramp down in certain instances for pumpable wastes [40 CFR 63.1206(c)(3)(viii)]. Additionally, the HWC

owner/operator must continue to calculate all rolling averages and cannot restart feeding hazardous waste until all operating limits are within allowable levels.

The AWFCO system must be tested at least weekly to verify operability test procedures and results must be documented and recorded in the operating record. If the HWC owner/operator documents in the operating record that weekly inspections will unduly restrict or upset operations and that less frequent inspection will be adequate, AWFCO operability testing can be extended, but it must be conducted at least monthly.

Excess Exceedance Reports

Excess exceedance reports are designed to function as a compliance tool. HWC owners/operators are to report to the permitting agency whenever an affected source incurs 10 exceedances of OPLs or emissions standards monitored with a CEMS within a 60 day period [40 CFR 63.1206(c)(3)(vi)]. The 60-day period restarts after the notification of the 10th exceedance.

An HWC that must submit an excess exceedance report may be unable to operate under its current operating limits, which suggests that the source may need to perform a new comprehensive performance test to establish more appropriate operating limits.

Emergency Safety Vent Openings

ESV openings are safety devices designed to prevent catastrophic failures, safeguard the unit and operating personnel from pressure excursions, and protect the air pollution control train from high temperatures and pressures. Requirements that govern the operation of ESVs appear at 40 CFR 63.1206(c)(4) and include: 1) treatment of combustion gases, 2) the need for an ESV operating plan, and 3) ESV reporting requirements. ESV operating plans can be submitted separately or included in the HWC-specific SSM plan, provided that a combined plan specifically addresses the events preceding and following an ESV opening.

Combustion System Leaks

The term “combustion system leaks” refers to leaks that are called fugitive emissions under current RCRA regulations, and are controlled using maximum combustion chamber pressure. This parameter is designed to prevent leaks of gaseous, liquid, or solid materials from the combustion system when hazardous waste is being fed to or remains in the combustion chamber.

To demonstrate compliance with leak requirements, the HWC owner/operator must either: 1) maintain the combustion system pressure lower than ambient pressure at all times; 2) totally enclose the system; or 3) gain approval from the permitting agency to use an alternative approach [40 CFR 63.1206(c)(5)]. An AWFCO is required if the combustion chamber pressure

at any time (i.e., instantaneously) exceeds ambient pressure [40 CFR 63.1209(p)]. For instantaneous monitoring of pressure, the detector must detect and record pressure constantly without interruption and clearly record a response more frequently than every 15 seconds.

Operation and Maintenance Plan

Each HWC owner/operator must prepare and at all times operate according to an operation and maintenance plan that details procedures for operation, inspection, maintenance, and corrective measures for all components of the HWC, including the air pollution control system [40 CFR 63.1206(c)(7)]. The plan must prescribe procedures that ensure compliance with general operation and maintenance requirements [40 CFR 63.6(e)] and provide that the HWC will maintain good air pollution control practices that minimize emissions of pollutants, AWFCOs, and malfunctions. The plan should describe procedures that begin immediately upon initiation of AWFCO and provides for a gradual ramp down of the hazardous waste feed.

Operation and maintenance plans for hazardous waste incinerators equipped with a baghouse must include a prescribed inspection schedule for baghouse components and use of a bag leak detection system to identify malfunctions. This baghouse operation and maintenance plan must be submitted to the permitting agency with the initial comprehensive performance test for review and approval [40 CFR 63.1206(c)(7)(ii)].

DOE Implementation Issues

The new HWC MACT standards will significantly impact DOE's existing hazardous and mixed waste incinerators and perhaps other DOE facilities. The principal compliance options available to affected DOE facilities to meet the standards are to 1) use feed control alone, 2) use a combination of feed control and air pollution control system modifications, and 3) cease burning hazardous waste.

Compliance with the HWC MACT standards is likely to be expensive and the time period to achieve compliance is relatively short. Managers of affected facilities that will continue to burn hazardous waste will want to plan as soon as possible for procurement of equipment needed to achieve compliance with the standards.

Managers of DOE sites planning to send waste to a facility subject to the HWC MACT emission standards need to be aware that planned treatment schedules may be affected by the new standards. Communication between managers of waste generation/storage sites, sites affected by the MACT rule, and the DOE Office of Environmental Management will be needed. The possibility that schedules associated with compliance agreements, orders, and/or site treatment plans for mixed waste [§3021(b) of RCRA] could be affected by implementation of the MACT standards should be considered.

Enforcement Issues

Enforcement of the HWC MACT emission standards will generally occur via normal CAA, or State equivalent, enforcement procedures. The MACT rule does not alter these procedures. Violations of CAA requirements are subject to enforcement by EPA, authorized States, and private citizens. Enforcement can generally proceed against any person who violates a requirement imposed under the CAA. The term "person" is defined to include Federal agencies and any officer, agent, or employee thereof [CAA, §302(e)]. Private citizens can bring a civil action against a Federal agency for violation of applicable emission standards or an order issued by EPA or a State with respect to such a standard [CAA, §304(a)(1)].

Although §1006(b)(1) of RCRA directs EPA to avoid duplication by integrating RCRA administration and enforcement provisions with the appropriate CAA provisions, in limited instances RCRA enforcement authorities may be used. For example, RCRA permit requirements that may be less stringent than applicable MACT standards are nonetheless enforceable until the RCRA permit is modified (64 FR 52833). Also, more stringent permit conditions adopted under the RCRA omnibus clause would be implemented and enforced through the RCRA permit.